Vision Computing 17 (1999) pages 125-134, "The Lumigraph" by Gortler et al in Computer Graphics Proceedings, Annual Conference Series, 1996 ACM-0-89791-764-4/96/008 and JP-A-9-170914.

Calibration pattern store 37 stores each pattern of features together with a coordinate system relative to the pattern of features. The coordinate system, in effect, defines a reference position and orientation of the photographic mat and, as will be explained in more detail below, processing apparatus 6 calculates the positions and orientations at which each input image was recorded in the defined coordinate system (and thus relative to the reference position and orientation). In addition, however, in this embodiment, the coordinate system for each pattern is also used to define a viewing position and viewing direction from which the first image to be displayed each time the resulting three-dimensional computer model is accessed for viewing will be rendered. Consequently, therefore, because the viewing position and viewing direction of the first image is defined in this embodiment relative to the pattern of features on the photographic mat, the user at computer processing apparatus 2,4 can be informed of a position on the photographic mat which the part of the subject object

which is to appear in the first image should face.

Thus, referring again to Figure 2, in this embodiment, each pattern of features includes a marker 170 to indicate to the user the position on the photographic mat 24 that the part of the subject object which the user wishes to appear in the first image of the subsequently generated 3D computer model should face. In addition, in this embodiment, the word "FRONT" is also stored as part of the pattern alongside the marker 170 to indicate the purpose of the marker 170.

Figure 3 illustrates how the features making up the pattern in Figure 2 are defined in a coordinate system in this embodiment.

Referring to Figure 3, the coordinate system in this embodiment is a cartesian coordinate system defined by orthogonal x, y and z axes. The origin of the coordinate system is at the centre 150 of the pattern of features on the photographic mat 24, and the x and y axes lie in the plane of the features making up the pattern. Thus, the z coordinate of each feature is 0. The y axis passes through the front marker 170. The radius of the circle 160 defining the boundary of the pattern of features is

defined to be one unit in the coordinate system.

Referring again to Figure 1, mat data generator 38 generates control signals which are sent as signals 7 to customer processing apparatus 2 to enable customer apparatus 2 to control printer 18 to print a photographic mat 24 on a recording medium such as a piece of paper, or to customer processing apparatus 4 to enable customer apparatus 4 to control display panel 19 to display the photographic mat. More particularly, mat data generator 38 generates the control signals using data stored in calibration pattern store 37 defining a calibration pattern and signals received from the customer computer processing apparatus 2,4 providing details of the size of subject object and the type of printer 18 or display panel 19 (as will be described below). Mat data generator 38 also generates instructions which are sent as signal 7 to customer processing apparatus 2,4 defining the position on the photographic mat which the part of the subject object which is to appear in the first image of the resulting three-dimensional computer model should face. Images of the subject object on the photographic mat are then recorded by a camera 16 and returned to the processing apparatus 6 as signals 7 for processing. Mat data generator 38 stores in memory 32 data defining the